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A NEW LONGISROSTRAL MASTODON FROM
CHERRY COUNTY, NEBRASKA

BY

ERWIN H. BARBOUR

GEOLOGICAL COLLECTIONS OF HON. CHARLES H. MORRILL



A NEW LONGIROSTRAL MASTODON FROM CHERRY COUNTY, NEBRASKA

BY ERWIN HINCKLEY BARBOUR

During the season of 1914, field work in the fossil regions was pushed less vigorously than usual owing to lack of funds. Nevertheless some interesting and valuable material was obtained by the Nebraska Geological Survey, notably the great mandible of a new longirostral mastodon from Cherry County, together with associated tusk and bones.

The field season of 1913 was spent chiefly in northern Brown County, and adjacent parts of Cherry County. During the season of 1914, this work was extended well toward the central portion of Cherry County, in the exposures along the Minichaduza, Niobrara, and Snake rivers. The writer's last trip to this collecting ground was in the summer of 1900. Early in the summer of 1914, Mr. C. Harold Eaton, an assistant in the State Museum, was detailed to visit all of the towns along certain lines of railroad in quest of information relative, more particularly, to Pleistocene mammals. In the towns of northern Cherry County, it was learned that increasing numbers of mastodon remains were being discovered.

Accordingly Professor E. F. Schramm, and Mr. J. B. Burnett, equipped with teamster and outfit, explored the exposures around Burge. The postoffice Burge is located on the north bank of the Niobrara River, some twelve to fifteen miles southwest of Valentine, according to maps, but in reality is some three and one-half miles south of the Niobrara, in section 23, township 32 north, range 30 west.

Throughout this region, there are thick and extensive beds of Lower Pliocene, commonly called the Loup Fork. The streams here have good gradients, and strong currents. Consequently they have cut valleys of some size, and many bare patches, walls, bluffs, and ravines, have been developed. Canyons gash the Loup Fork to a depth of 200 feet, and expose numerous bones, wholly or partly, weathered out. Although fragmentary in most cases, many whole bones, jaws, and skulls may be procured. The remains of mastodons are so abundant that this deposit might fittingly be known as the mastodon beds. This has a deeper significance when we contemplate the

great extent of these deposits, and the large number of mastodon bones and teeth found in them. There seems to be about 200 miles of nearly continuous mastodon beds between Rock and Sioux counties. In the main, they are covered by sand and lost to view. Fossil bones are so common that ranchmen display them in rockeries upon their lawns, and have them on their mantels and shelves. Well diggers and drillers frequently report encountering them in their work. Mastodon "joints," that is the solid extremities of the great limb bones, and fragments of teeth and ribs, seem to be commonest. These early mastodons must have roved the State in great herds.

The best collections of the season came from a stream variously termed Snake Creek, and Snake River. The latter is to be greatly preferred since it avoids confusion with Snake Creek, and the Snake Creek beds, in Sioux County. The beds around Burge are equivalent to the well-known Snake Creek, and it might be distinctive, as well as associative, to call these deposits the Snake River stage.

The mastodon constituting the basis of this paper was found in the exposures bordering the Snake River in section 33, range 30 west, and township 32 north. The talus slope was strewn with fragments of the tusk and bone of a mastodon. This led the field party to search for the source of the bones higher up the canyon, where they found the mere tip of a tusk exposed in a cattle path. While unearthing this, certain associated bones were found, and finally the great mandible shown in the accompanying figures. It is assumed from the close association of these parts that they are related. Work in this quarry will be resumed later, in the hope of recovering the skull and other bones of this individual.

The mandible is uncommonly large, and faultlessly preserved. Unfortunately, the very tip of the rostrum, together with any tusks which it may have borne, are wanting. The great length of the rostrum would, in itself, be sufficient to warrant the assumption that tusks were present in life. The alveolus also suggests the probability of their presence, although of necessity they must have been slim.

Measured from the condyle, the unbroken length of the mandible, as found in the quarry, exclusive of tip and tusks, is 52 inches (1,322 mm.). Three large fragments of the tip, found at the end of the mandible, when set in position, increase the length to about 56 inches (1,424 mm.). Its total restored length, including the tusks, is 69 inches (1,754 mm.). There is every probability that the length ex-



SNAKE RIVER AND CANYON WALLS, WITH SAND HILLS IN DISTANCE.

Nebraska Geological Survey, July, 1900.



CAMP OF THE UNIVERSITY OF NEBRASKA AT SNAKE FALLS.

Nebraska Geological Survey, August, 1914.

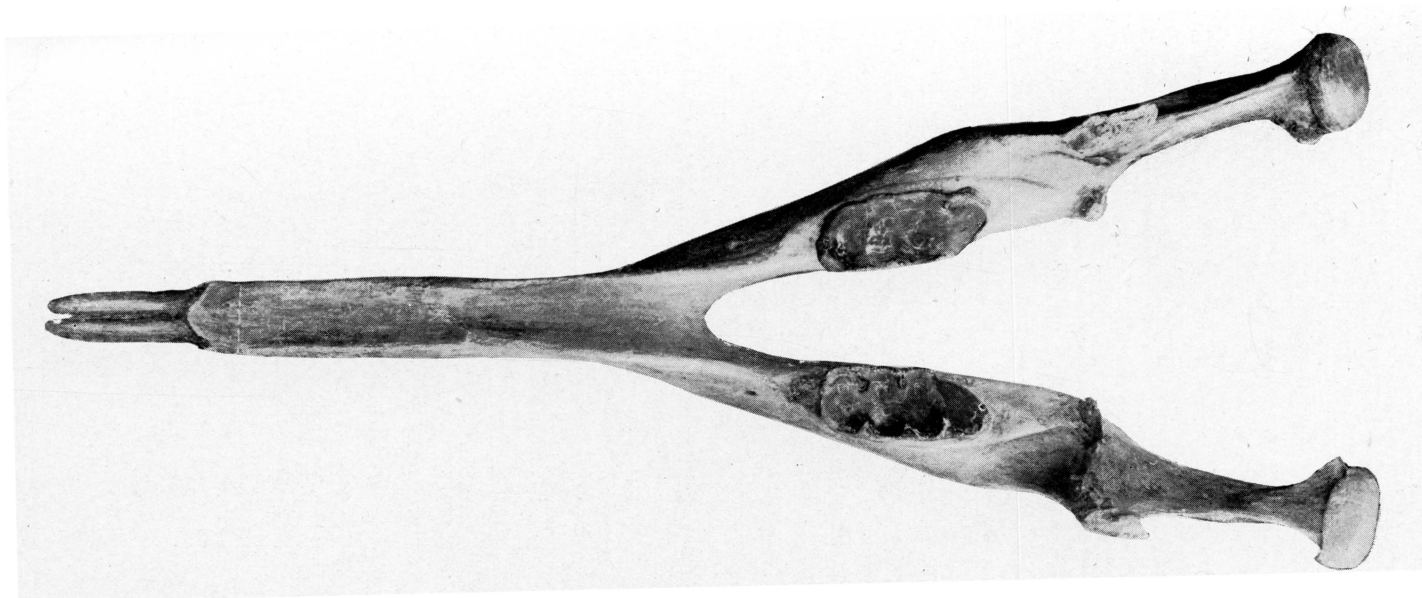


TETRABELODON LULLI.

Side view x 1/10.

The portion in front of the dotted line is restored.

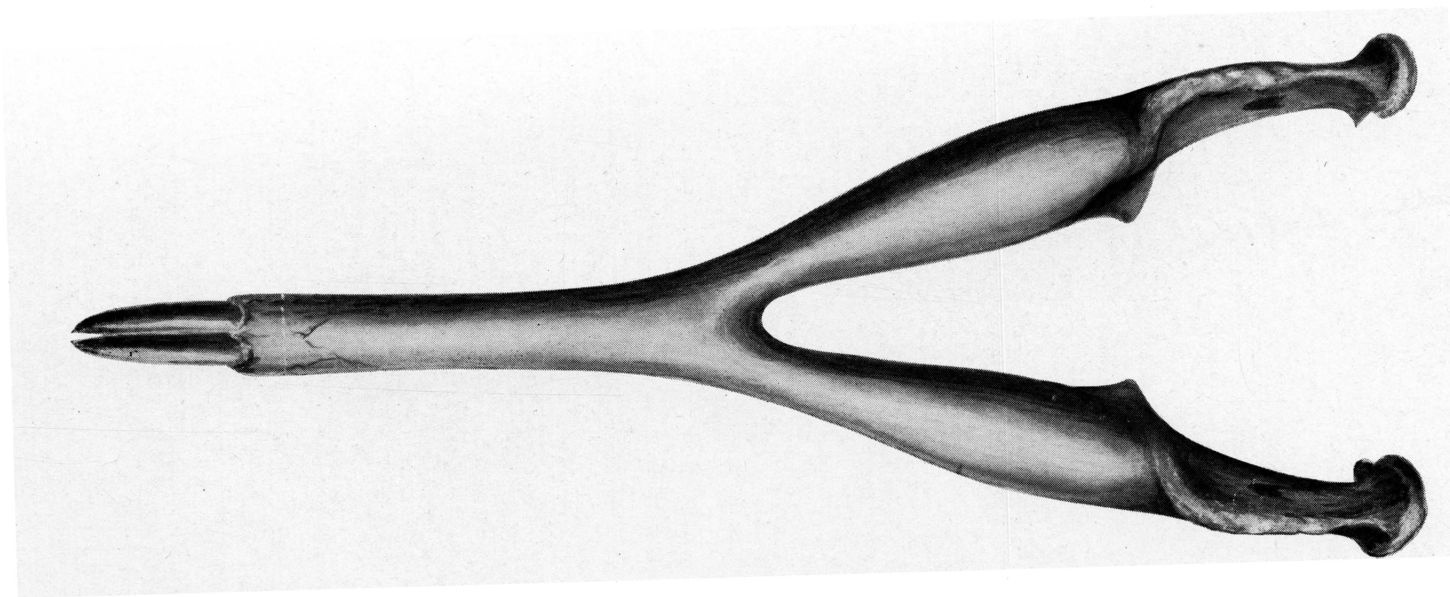
Collection of Honorable Charles H. Morrill.



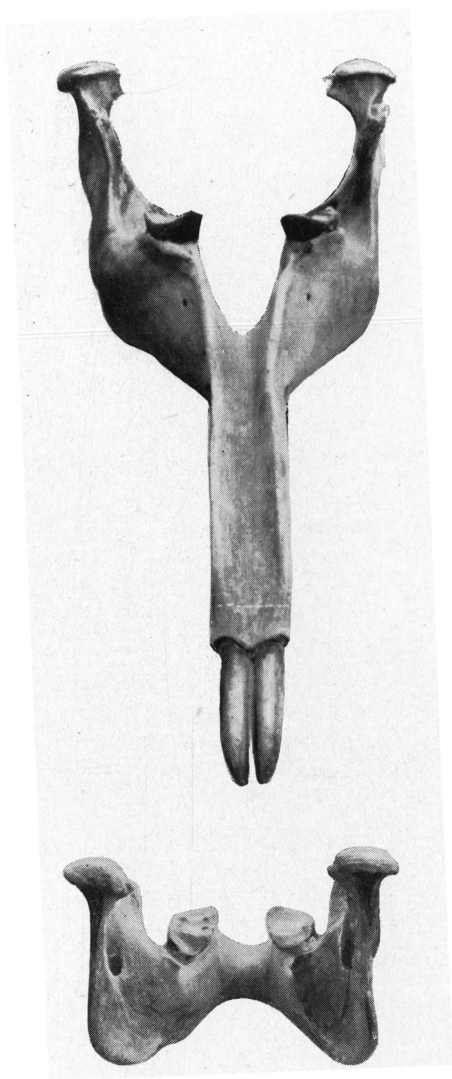
TETRABELODON LULLI.

Crown view x 1/10.

The portion in front of the dotted line is restored.



MANDIBLE OF TETRABELODON LULLI
Bottom view. x 1/10.



MANDIBLE OF TETRABELODON LULLI

Front and back views.

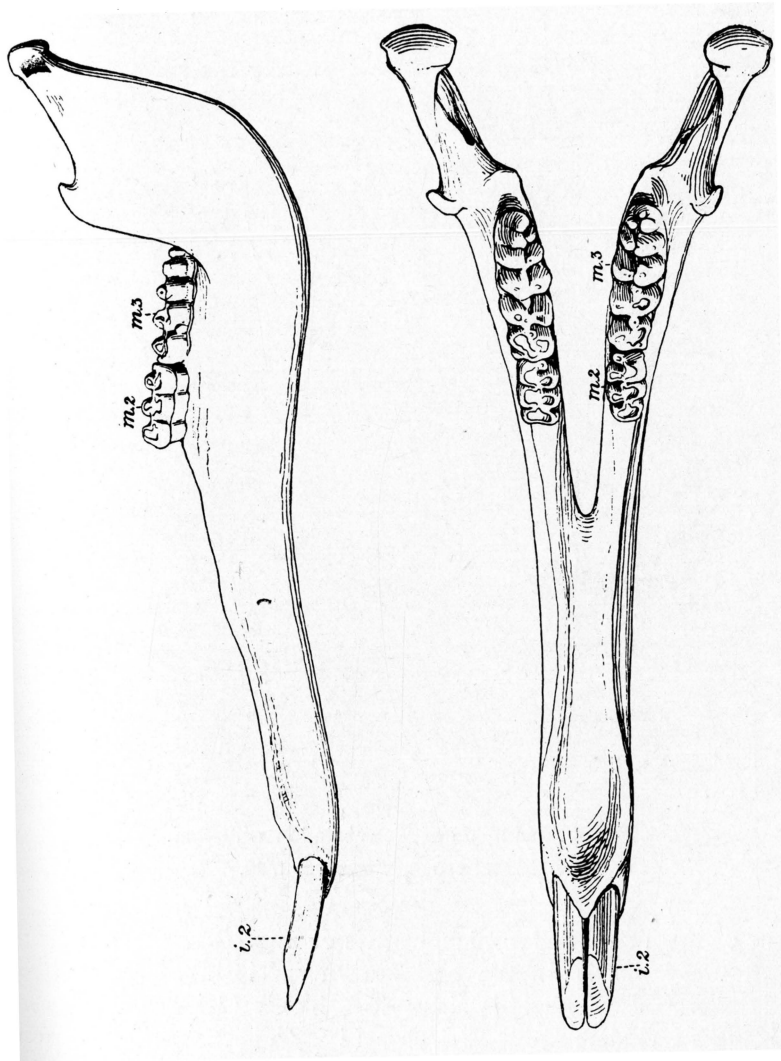


Fig. 1.—*Tetrabelodon angustidens*, Cuvier. Side and crown views. x 1/10.

ceeded $6\frac{1}{2}$ feet (2 full meters). Dr. Richard S. Lull, who examined this specimen, is undoubtedly right in believing the tusks, as restored, too short. Presumably they were two or three times as long as shown in the accompanying plates. Since, in any event, the length of the tusks must be assumed, a very moderate size was chosen. The powerful ascending ramus, and more especially the large and prominent coronoid indicate much longer tusks. It is much larger than

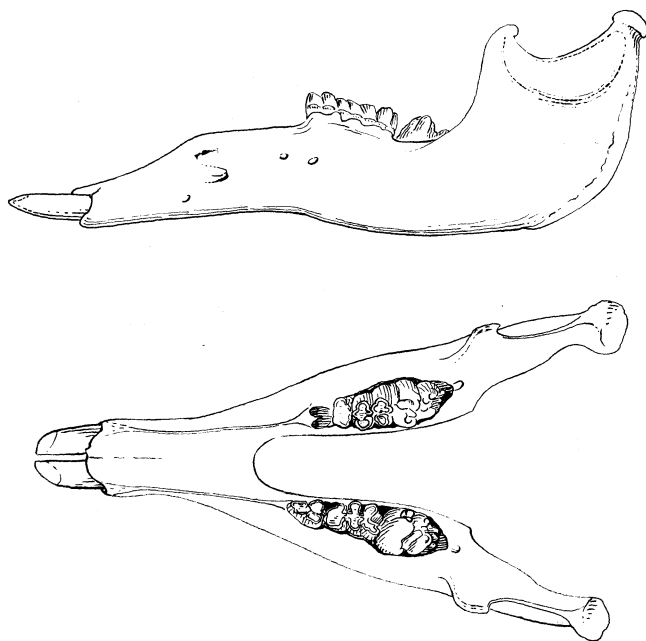


Fig. 2. Mandible of *Tetrabelodon willistoni*.

Side and crown views. $\times 1/10$.

either of the *Tetrabelodons*, *longirostris* or *augustidens*, and is of different proportions. In the best known specimen of *Tetrabelodon augustidens*, the mandible is about $46\frac{1}{2}$ inches (1,182 mm.) long, or with tusks included, about 52 inches (1,322 mm.). In *Tetrabelodon longirostris*, the symphysis is not greatly produced, and it bears two relatively large tusks. *Tetrabelodon campester* is much smaller, the symphyseal prolongation is much shorter, the ramus thin, and the inferior border curves without angle into the ascending ramus.

For this new species, we wish to propose the name *Tetrabelodon lulli*, for Professor Lull. It is not unlikely that it is entitled to rank as a new subgenus at least, and it might not be amiss to propose the name *Megabelodon*.

The rostrum of this new mastodon is greatly elongated and decurved. The rami are spread well apart by a curve, the convexity of which is outward; while in *angustidens*, the curve is inward. The lingual groove is 2 inches (51 mm.) deep, growing shallower toward the tip,

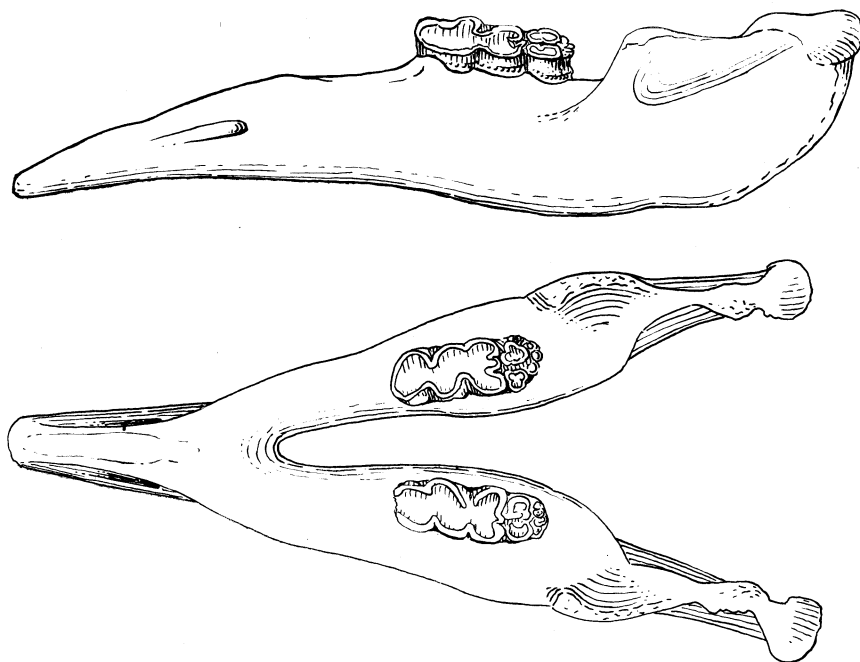


Fig. 3. *Eubelodon morrilli*.
Side and crown views. x 1/10.

and bounded on the sides by narrow, rounded edges. The ramus is massive and powerful, being 31 inches (788 mm.) from the bifurcation to the condyle. It is 8 inches (206 mm.) deep, and 4 inches (102 mm.) thick at the molars. Immediately back of the molars, the thickness increases to 5 inches (127 mm.). The symphyseal prolongation cannot be less than 28½ inches (724 mm.). Where the elongated mental foramen enters the jaw, the depth of the mandible is 5 inches

(127 mm.), and the thickness 4 inches (102 mm.), whereas in *angustidens*, it is about 4 by 5 inches, or broader than deep.

The angle is prominent, though thin, and flares outwardly. The ascending ramus is very broad and erect, and rises well above the crown of the molars. Below the condyle, the condyloid process is

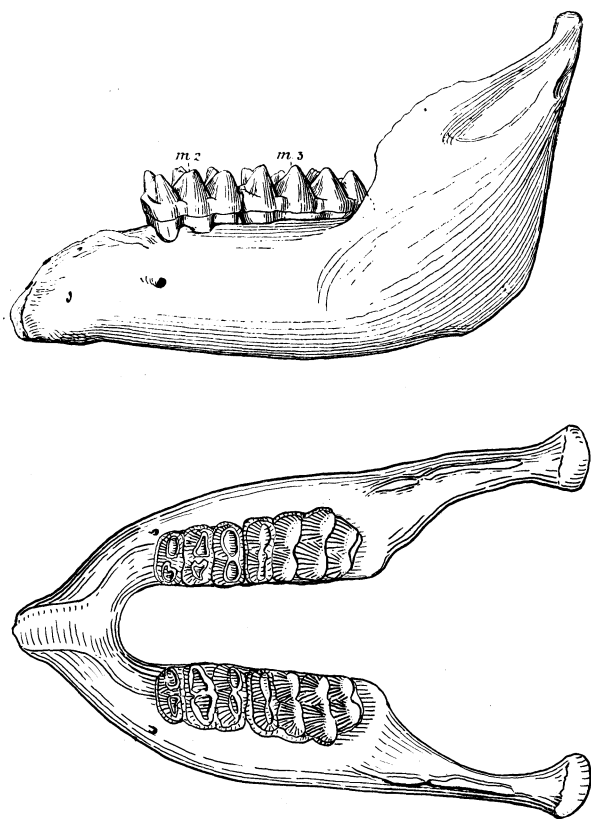


Fig. 4. *Mastodon americanus*.
Side and crown views. $\times 1/10$.

constricted into a very distinct neck. The condyle is noticeably convex, and its dimensions are $4\frac{1}{2}$ inches (114 mm.) transversely, by $2\frac{3}{4}$ inches (69 mm.) postero-anteriorly. The apex of the condyle is $7\frac{1}{2}$ inches (191 mm.) above the crowns of the molars. The total

outside distance across the condyles is $23\frac{1}{2}$ inches (597 mm.), and across the coronoids 19 inches (483 mm.).

The coronoid process resembles that of a typical mammal, and is unlike the later mastodons and mammoths. It is deeply roughened for ligamentous attachment, and is strongly recurved. The lowest of

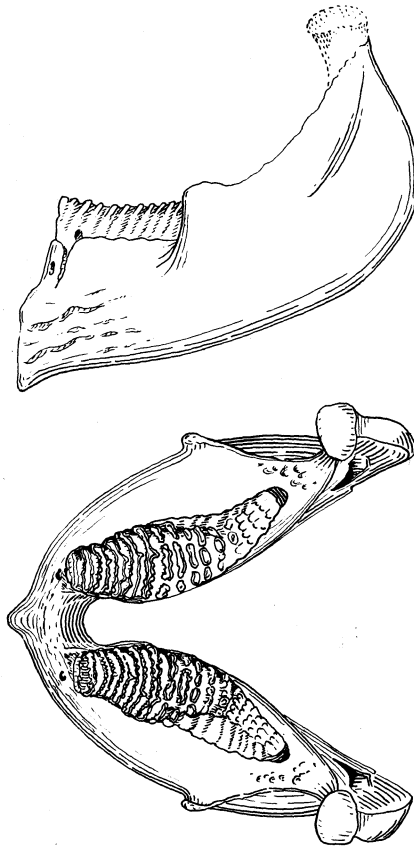


Fig. 5.—*Elephas imperator*, the Imperial Mammoth.
Side and crown views. $\times 1/10$.

the three mental foramina is produced into a deep narrow fossa 10 inches (254 mm.) long. The foramen itself is noticeably large, and must have admitted great nerves and vessels. The same condition obtains in the new mastodon, from Brown County, which we recently

named *Eubelodon morrilli*. In the mastodon, which we called *Tetrabelodon willistoni*, from the same beds, this foramen is large, but only moderately produced. In *Mastodon americanus*, the mental foramen ordinarily lies below the front edge of molar No. 2. In the mammoths and modern elephants, these foramina are small, in many cases numerous, and well upon the symphyseal line.

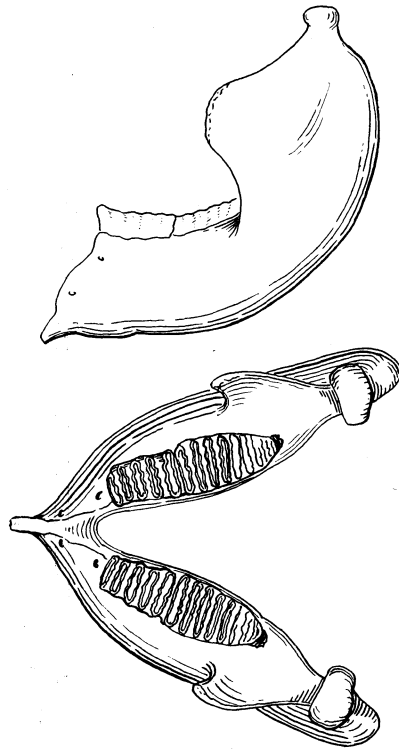


Fig. 6.—Mandible of *Elephas indicus*.
Side and crown views. x 1/10.

The mandible of *Tetrabelodon lulli* is from an individual advanced in age. The teeth are worn flat and low, and are deeply cupped at each of the four transverse ridges. Two cones are discernible in each ridge, but no secondary cones are apparent. Contrary to the usual order, the teeth are ground with an inward and backward slant. The back slant on the last transverse ridge is noticeably steep. The molars

are $8\frac{3}{4}$ inches (222 mm.) long, by $3\frac{1}{2}$ inches (89 mm.) wide. The long, attenuated symphysis is an ancestral feature, and its maximum development appears to have been reached in *Tetrabelodon lulli*. The narrowed and reduced alveolus seemingly marks a decline in the mandibular tusks, which foreshadows the reduction and ultimate suppression of the prolonged rostrum itself.

After an immeasurably extended period of survival, wide migration, and fundamental modification, the longirostral mastodons changed into the brevirostral by insensible gradations. Many of the developmental stages are already known, and many more are to be discovered. It may be safely predicted that the mastodon beds of Nebraska will furnish many links in the phyllogeny of the Proboscidea. Even after the mastodons lost their inferior tusks, and became short-jawed, they occasionally bore in the lower jaw, one or two dwarfed tusks. This holds true in *Mastodon americanus*, which survived almost to modern times, and which had, in some cases, small functionless lower tusks. However, in some examples the tusks were of such size as to warrant the establishment of a separate group. In others, the tusks are wanting altogether.

The maxillary tusk found associated with the mandible of *Tetrabelodon lulli* is slightly decurved, and is $5\frac{1}{2}$ feet (1,678 mm.) in length, and $4\frac{1}{2}$ inches (114 mm.) in diameter. Unlike *Eubelodon morrilli*, the tusk has an enamel band, and the tip is worn to a very obtuse edge. The associated humeri seem uncommonly short, and stout. They are about 30 inches (762 mm.) in length.

In the Brown County mastodons, the acetabula have bold cotyloid notches, and singularly deep broad cotyloid fossae, which are roughened and deeply pitted. This indicates that the ligaments were uncommonly large. The heads of the femora show unmistakable scars. It is beyond the limit of probability that this is coincidence. Contrary to the usual rule, these proboscideans had the ligamentum teres strongly developed. In the case of the acetabula of *Tetrabelodon lulli*, the fossae are narrow and deep, and the heads of the femora have corresponding scars. In *Elephas*, the acetabular fossae are nearly obliterated, and the heads of the femora are without scars. Absence of the round ligament has been counted a character of the Proboscidea; the Brown County mastodons, however, seem to be exceptions to the rule.

The following associated fossils have been noted, namely:

1. *Testudo orthopygia*.
2. *Alticamelus*.

3. Camel indet.
4. Parahippus.
5. Hipparion.
6. Neohipparion.
7. Teleoceros fossiger.
8. Merycodus necatus.

In this connection, it may be well to mention that the following Nebraska proboscideans are represented in the State Museum:

1. Tetrabelodon lulli.
2. Tetrabelodon willistoni.
3. Eubelodon morrilli.
4. Tetrabelodon euhypodon.
5. Mastodon merificus.
6. Mastodon americanus.
7. Elephas columbi.
8. Elephas imperator.
9. Elephas primigenius, and several undetermined forms believed to be distinct.

Plates 3 to 6 inclusive, and figures 2, 3, 5, and 6 are reproduced from specimens in the collections of Honorable Charles H. Morrill, the State Museum, the University of Nebraska.

The University of Nebraska
Lincoln, September 15, 1914

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